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Silver Plating Technique Seals Leaks in Thin Wall Tubing Joints

The problem:

The inner surface of a rocket nozzle consists of a number of Inconel X-750 thin wall tubes brazed together, side-by-side, completely around the inner surface. The tube material provides for the passage of coolant. After complete fabrication and during testing of the nozzle, leaks have been found at the braze joints. Normally, leaks are repaired by torch or tungsten inert gas brazing. This technique is not satisfactory for Inconel X-750 thin wall tube material because the material is susceptible to cracking after being completely fabricated.

The solution:

The hot gas side of the joint in the leakage area is cleaned and is stylus silver plated. The pressure differential across the silver during hydrostatic test and subsequent use forces the ductile silver into the leak area and seals it.

How it's done:

The material is cleaned and smoothed in the leakage area by sand blasting or with abrasive paper or cloth. The hot gas side of the joint in the leakage area is electroplated with silver by a hand stylus (Dalic)

method. The silver plating is built up to a thickness to cover and seal the leaks.

Notes:

1. This technique is highly advantageous over other methods because it does not require the application of heat.
2. Inquiries concerning this innovation may be directed to:

Technology Utilization Officer
AEC-NASA Space Nuclear Propulsion
Office
U.S. Atomic Energy Commission
Washington, D.C. 20545
Reference: B66-10703

Patent status:

No patent action is contemplated by AEC or NASA.

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